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DANTE AS A NATURALIST.

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THERE is one peculiarity of Dante that has struck all readers of the 'Divina Commedia,' and that is his desire throughout to be exact in his descriptions. It may not be uninteresting, therefore, to consider what he has to say on the subject of natural history. He uses animals allegorically as part of the *dramatis personæ* of the 'Commedia,' and he often refers to them in simile. In so doing, we find that he may be merely taking some generally recognized characteristic of a beast, or describing it accurately from personal knowledge, and the value of his remarks will vary according as he is speaking from his own experience, or from what he has accepted from others.

The best division under which to consider them will be foreign animals, and those which he has met with in Italy. Of the first class—foreign animals, as one might expect—his descriptions are for the most part general. For instance, in the first canto of the "Inferno," the Lion—the emblem of pride—has nothing very special about it as it advances "with head uplifted, and with ravenous hunger." He may have seen one in some ducal Lion-pit, but the description of it might as well be a reminiscence of some heraldic imaging of the beast, to which all the other references are to be attributed, with the exception of

(Inf. xxxi. 118) the passage where he is speaking of Antæus gathering a thousand Lions as sport; and there he is merely quoting Lucan.

Of other foreign beasts, he makes allusion to the Elephant and Whale, both in speaking of the giants that rise around the ninth circle in the "Inferno" (Inf. xxxi. 52), where he makes the quaint remark that Nature did well to give up forming such creatures as the giants; and if she does not repent of Elephants and Whales, it is because they have not the intelligence to do harm; wherein Dante shows that he does not appreciate the intelligence of the Elephant, and perhaps, Mr. Bullen would add, of the "Cachalot."

Of other foreigners, he mentions the Bear, but only in reference to Elisha; the Ape and the Pelican, both in a conventional way.

Perhaps under this heading we should include his allusion to the Bivero or Bevero (Inf. xvii. 22).

Dante and Virgil have come to the margin of the eighth circle, whence they are to descend on the back of Geryon to the ninth. The monster, with a human head, paws, and a serpent's body, came up, and thrust on shore its head and bust; "but on to the border did not drag its back." The poet compared its position to that of a Beaver, "who among the guzzling Germans plants himself to wage his war" (upon the fish). Obviously Dante did not know the animal intimately, and, like many an Englishman of the present day, who fails to distinguish between the Sewer-Rat and the Beaver's humble representative the Water-Rat, accepted the common view which confused the fish-eating Otter with the rodent Castor. This is clearly brought out in Boccaccio's note:—"Bevero, the male Otter: this animal is very fond of fish; therefore it takes its stand on the banks of the Danube, puts its tail, which is very thick, into the water, and, because there is much fat on it, an unctuous matter exudes from it, by which the water is covered, as it were, with oil. To this the fish come, and the Beaver turns round and takes his pick of them"—a neatly concocted theory, from the way in which they have seen the Beaver sitting, and the shining greasy look of its tail. Had he seen a Norwegian landing fish with an oar, he doubtless would have let the Biber bring the fish to land in more



sporting way, without turning round, Dante, however, knows what an Otter looks like, for (Inf. xxii. 36) he compares a baron of Thibault, King of Navarre, when he is being dragged out of the boiling pitch, to one—which is a very good simile.

This completes the list of extraneous animals, unless the Lynx be included; for some would have it that it is the Leopard, or the Caracal, that Dante intends by the Lonza, which he selects as representing worldly pleasure, on the one hand, and Florence, torn by the factions of the Bianchi and Neri, on the other. Set us look at what he says of it (Inf. l. 32):—

“ Une lonza leggiera et presto molto,
Che di pel maculato era coperta; ”

and again (Inf. xvi. 108), “ la lonza alla pelle dipinta.”

There is no doubt as to what he would set before us—some quick-stealing feline animal with a mottled coat; and probably he is following his master Virgil, who speaks twice of “*variæ lynces*,” which take us back to the βαλῆαι λύγες of the ‘Alcestis.’ It is hence that several commentators, going back to the fact that Lynces were the satellites of Bacchus, and that in the classics the idea is associated with India, while at times the word Tiger is used, determine that the word Lynx here must mean either the Leopard or the *Felis caracal*, which are not European specimens. I cannot see why it should not be the *Felis lynx* (the Common Lynx), which was to be found in most parts of Southern Europe; an animal with long fur of dull reddish grey, marked upon the sides with oblong spots of reddish brown, which become round and smaller on the limbs; the lower part mottled with black and white. This seems to suit the “*pelle maculata*” and “*dipinta*”; while Boccaccio’s tale that, when one was being led through the streets of Florence, the boys followed it, and called it a “*pard*,” shows how commonly the two were mistaken. It is not at all impossible that Dante may have come across the beast on some hunting expedition, and that it should have been included in the second division—that of animals with which Dante met in Italy.

Under this head I will first consider those which he met in the chase. The most important of these are the Dogs, of which one knows a good deal from pictures by early masters, and

perhaps the simplest way of approaching the subject would be to glance at the Dogs which one finds there.

The reader will be able to supply from his own knowledge many mediæval pictures containing Dogs. I will only take one by Vittore Pisano, who was born in 1380—a picture which all will know, as it is in our National Gallery. It is the Conversion of St. Eustace. He, like St. Hubert, meets a Stag with a crucifix between its horns. Eustace is on horseback. Near him are two Dogs of mastiff breed, and one that is a kind of staghound. In front are two setters; to the right two magnificent greyhounds pursuing a Hare, which is bolting for a wood which contains a Brown Bear; on the left the heads of two big hounds with drooping ears, obviously of the nature of bloodhounds. In this picture are to be found most of the recognized breeds of mediæval Italy. The commonest of them is Veltro, the greyhound—the Vertagus of Martial—that was trained to bring to his master the Hare unhurt. It is of them that Dante speaks where he tells of the pursuit of Lano and his friends through the wood of human trees (*Inf.* xiii. 126). He says the Hell-hounds come on like greyhounds let out of a leash; and again (*Inf.* xxiii. 18), more cruel than a Dog to a Hare, which it seizes in its teeth. The greyhound was used for pursuing, but did not find game. For this purpose a kind of setter was used. He marked the Hare for the greyhound, and put up the birds for the Hawk. The Dog was called Bracco, whence the French Brague, and does not occur in the 'Comedy'; but Dante, in the "Convito," says every excellence in everything is to be desired, "Siccome nel bracco il bene oderare, nel veltro il bene correre."

He is speaking of a bigger breed of Dogs in Ugolino's dream (*Inf.* xxxiii.), where the latter saw the Archbishop hunting the Wolves and whelps upon the mountain ("con cagne magre studiose et conte"), which Longfellow translates, "With sleuth-hounds gaunt, eager, and well-trained." They were probably a breed of mastiffs ("mastini," the Roman Molossus), which were used also for catching thieves (*Inf.* xxi. 44). It was with these that Nastigio degli Onesti saw his phantom ancestor Cavalcante hunting the fair Lady Disdain in the woods of Chiasso, near Ravenna. This breed originally came from Epirus, but there was a bigger one still coming from Sarmatia, known as Alano; so much stronger,

that Ariosto, in the last scene in the 'Orlando Furioso,' where he is describing the Saracen pinned down by Ruggiero, says:—

“ Come mastin sotto il feroce alano,
Che fissi i denti ne la gola abbia.”

This is all Dante has to say of hounds, and I will therefore turn to their quarry.

Of Wolves he often speaks; they are to him the symbol of avarice, either of the Florentines (Purg. xiv. 50), or of the Popes (Par. ix. 132); nor could any animal better describe insatiate desire that derives no benefit from getting. Two passages in particular give one a perfect picture of the beast (Inf. l. 49): She-Wolf (“Chi ditute brame Sembiava carica nella sua sembianza”); and again he speaks (Purg. xx. 10) of the limitless hunger of the “old she-Wolf, who more than all the beasts has prey” (“Per la sua fame senza fine cupa”). We have a sketch, too, of the Wild Boar (*porco*), which modern Italian keeps for the domestic Pig, using *cinghiale* for the nobler animal. He tells us of its tusks, and describes the noise a Boar-hunt makes (Inf. xiii. 113) as beast and dogs come crashing through the branches. Apparently they did not hunt the Fox, for the only allusions to the Volpe refer in a general way to his cunning (as when he speaks of the Pisans (Purg. xiv. 53), but they hunted the Deer (*dama*) (Par. iv. 6)). In an amusing passage he alludes to it. He says his mind was so evenly divided that he is like a man free to choose between two kinds of food equally removed and equally tempting, who would die of hunger; and so would stand a hound between two does. Few now quote this simile, for to our generation Heine's Donkey between two bundles of hay is better known.

Whatever Dante's enjoyment of the chase may have been, there can be little doubt that he preferred hawking. According to Plumptre this pursuit, which had been lately introduced into Italy by Federigo II., formed part of Dante's education, and he had probably read a copy of Frederic's work on hawking, which existed in manuscript with hand-painted pictures, and must have been in a way to that age what Gould's 'Birds' has been to ours.

This we gather from the way in which he used terms in falconry, and from the fact that by piecing together his different similes we have a very fair picture of the sport. He says, for

instance (Inf. iii. 117), that the damned souls rush to Charon, when he signs to them ("come auigel per suo richiamo"), like a Falcon to his call. That is the exact meaning of "richiamo," the sound made by the falconer, which from its earliest training the bird associates with the idea of food; it is sometimes used as the equivalent of "logoro," lure (Purg. xix. 62); the German Federspiel, made of leather with feathers attached, from which the Hawk is fed, that it may learn to connect with it the sight of its food, and may come back to its master if it found no bird. From what Buti says, occasionally actual birds were used for the lure, differing according to the kind of Hawk employed.

Falconers recognized two kinds of birds. First, the long-winged or proper Falcons, of which class the Gyr Falcon and the Peregrine (*Falco peregrinus*) were the ordinary representatives. Of these the Gyr Falcon, a big bird, inhabits Northern Europe only, and does not seem to have been imported till later into Italy for sporting purposes; while the Peregrine is the Falcon of Dante that figures in many similes. The second class consisted of the short-winged, and were generally represented by the Goshawk (*Falco gentilis*)* and the Sparrow-Hawk (*Sparvius*).† Dante knew both. He speaks of the two guardian angels of the quiet valley in the "Purgatorio" as "astore" (Purg. viii. 104), which is the Goshawk, and he has much to say of the "sparviere" (épervier). He notices it with regard to the common custom of the short-winged grappling their quarry instead of striking it dead, for, in speaking of the two demons fighting (Inf. xxii. 139), he says that one

"Fu bene sparviere grifagno
Ad artigliar ben lui."

He also alludes to a method of taming the wild Sparrow-Hawk, for the envious in Purgatory expiate their sins by having their eyelids fastened together with iron wire (Purg. xiii. 71), "as is done to a wild Sparrow-Hawk, because it will not keep still"—a mode of treatment recommended by Frederic.

To turn to the sport itself. We have a picture of the process (Par. xix. 34). The start: the Hawk, on having his hood removed, shakes his head and flaps his wings (coll' ali si applauda), showing his eagerness, and making himself fine. Next (Purg. xix. 64) he surveys his feet, then turns him to the call (of the

* *Astur palumbarius*.

† *Accipiter nisus*.

falconer), and "darts forward through strong desire for food that draws him thither." He wheels up into the air (Par. xviii. 45), carefully watched by the eye of the falconer. He spies his quarry, and makes for it. The only actual instance we have is in Inf. xxii. 131: this time a Duck, that at the Falcon's approach dives under, and comes up cross and weary. A very good description. I watched a big Hawk once in Norway that was dividing its attentions between a Heron and a Duck, neither of which left the sea-pool where they were. The Hawk settled on a tree in a small island, and kept sweeping down on first one and then the other. There was a great deal of shrieking, and the Heron baffled it by its flight, and the Duck by diving, coming up each time, one might judge from the sounds it emitted, distinctly cross and weary (Inf. xvii. 127). In Dante's simile of the approach of Geryon, we have a picture of the disappointed Hawk:

"E'en as a Falcon long upheld in air,
Not seeing lure, or bird upon the wing,
So that the falconer utters, in despair,
'Alas, thou stoop'st!' fatigued descends from high,
And, whirling quickly round in many a ring,
Far from his master sits—disdainfully."

With this ends Dante's allusion to sporting; but, as the modern Italian, who goes *alla caccia* with his gun and his game-bag, shoots for the pot, and spares neither Yellowhammer nor Wag-tail, perhaps this would be the place to mention the professional "che dietro all' uccello sua vita perde" (Purg. xxiii. 3). He apparently crept up, and looked cautiously through the leaves, and then took a sitting shot; for we are told (Purg. xxxi. 61) that the young inexperienced bird will wait till he has had two or three shots, but at the *full-fledged* (pennuto) it is no good shooting, and in vain is the net spread in its sight. The latter part is a quotation from the Book of Proverbs, "*frustra jacitur rete ante oculos pennatorum*" (an equivalent of "Old birds are not to be caught with chaff"), which in our version has been reduced to nonsense by translating (pennati) as "any bird."

Domestic animals and cattle next claim attention. Of the former, we have the Cat pursuing the Mouse (Inf. xxii. 58), and four allusions to Dogs. In the first, as in Calverley, "the Dog said nothing, but searched for fleas." He is describing the

usurers, who are worried by the fiery flakes that fall upon them, and are trying to remove them (Inf. xvii. 49):—

“Non altrimenti fan di state i cani
O col ceffo, o coi pie, quando son,
O da pulci, o da mosche, o da tafani morsi.”

We are next introduced to him gnawing a bone (Inf. xxxiii. 78), and then we see the faithful House-Dog flying at a tramp (Inf. xxi. 68), and, lastly, the impotent cur (botolo) snarling at the passer-by (Purg. xiv. 46). I can find no allusion to the Sheep-Dog, which is surprising, especially when Giotto has left us the picture of such a fascinating little puppy in his carving of pastoral life on the tower of the Cathedral at Florence. But, though he is not mentioned, the Sheep (“pecore pecorelle agnelli”) are alluded to on several occasions. I always imagine them to be Giotto’s Sheep, not the great big specimens with which one meets in England. He describes the sportive lamb (Par. v. 82), that leaves its mother’s milk, and frolicsome and simple, combats at its own pleasure with itself. He speaks of them, as did our early poets, as the “silly Sheep” (Par. v. 80), but they supply him with two of his most fascinating similes. The first is a long one, describing a frosty morning in early spring, and the shepherd driving out his flock. There is such an atmosphere about it; it reminds one of Turner’s ‘Winter’s Morning’ (Inf. xxiv. 1). It is getting near the equinox; the hoar-frost on the ground looks like snow, but soon evaporates.

“The rustic now exhausted his supply,
Rises betimes, and looks out, and sees the land
All white around, whereat he strikes his thigh,
Turns back, and, grieving, wanders here and there,
Like one disconsolate, and at a stand;
Then issues forth, forgetting his despair.
For, lo! the face of nature he beholds
Changed on a sudden—takes his crook again,
And drives his flock to pasture in the folds.”

Again, he gives us an accurate picture of them (Purg. iii. 79), where they come out of the fold by ones and twos and threes; and others stand timid, turning their eyes and noses down to the earth; and whatever the foremost one does, so the others do, huddling close up to it if it stops, simple and quiet, and do not

know any reason for what they do. An excellent simile to describe a crowd blindly following their leader, and one which he repeats in slightly altered form in the "Convito," l. 11,

We have been speaking as yet of Sheep; they are to be distinguished (Par. ix. 131) from the Goats, for which we have three names—"capra," "becco" (German, Bock), and (Inf. xxxii. 15) "zeba," from "zibbe," a corrupted form of the German "Ziege"; these he has watched climbing over almost impossible ways (Inf. xix. 132), as one sees them in Corsica, often to one's imminent peril, if one is walking on the road below, or butting each other with their heads down (Inf. xxxii. 50) ("come due becchi, cozzaro in sieme"); or quietly chewing the cud watched by their shepherd (Purg. xxvii. 76), "just as the Goats become quiet while ruminating, which had been agile and venturesome upon the mountain tops before they took their meal, resting hushed in the shade while the sun is hot, watched by their shepherd, who leans upon his staff." I have quoted Vernon's translation. He agrees with Longfellow in translating "proterve" venturesome. I should be inclined to think it was more likely a reminiscence of "*hædique petulci*" of Virgil. Of other cattle, we have "bue" and "toro"; the former obviously the meek-eyed, long-horned Oxen (Purg. xxxii. 145), which it is so hard to pass in a narrow street of some old Tuscan town as they sway their heads from side to side beneath the yoke (Purg. xii. 1) while they drag the rough carts full of wine-casks and other agricultural produce. The poet gives one quaint touch with regard to them (Inf. xvii. 75) when he makes the great usurer Scrovigni distort his mouth, put out his tongue ("come bue chi il muso lecchi"). He has nothing interesting to tell us about bulls. One passage (Inf. xii. 22) is an adaptation of a simile of Virgil, with regard to the sacrificial bull that reels from the stroke it has received; the other (Par. xvi. 70) tells us that a blind bull falls more headlong than a blind lamb—which, though true, does not add much to our knowledge.

It is worth while to turn for a moment to Dante's reptiles before considering his birds. The Frog is mentioned several times. He alludes to Æsop's fable of the fight between "Il Rana e Il Tope," the latter of which obviously comes from "*talpa*," and originally meant "mole," but is here used for Mouse. The Frog appears also in the description of Caina (Inf. xxxii. 31), and of

the fifth Bolgia in the "Inferno," in which the judges who take bribes for giving judgment squirm in a marsh of boiling pitch, over which Graffiacane and other such demons wheel on ponderous wings. The wretched souls would fain get respite by emerging from the pitch, and so (Inf. xxii. 25)—

"As on the brink of water in a ditch,
The Frogs stand only with their muzzle out,
So that they hide their feet and other bulk;
So upon every side the sinners stood."

But not for long. The warder demons, when they see them, swoop down upon them, at whose approach they mostly plunge again into the pitch, though Dante saw one wait, "as one Frog remains, and another dives down." We have, too, the description of the accursed souls that fly before the approach of the celestial messenger, who strides dry-shod across the Styx (Inf. ix. 76), "even as Frogs disappear in all directions across the water before the (biscia) snake, till they are huddled all together on the land."

This brings us to the consideration of snakes, for which he used as generic names "serpe" or "serpenti," crawling animals. Since the thieves in Hell (Inf. xxiv. 82) are punished by snakes, he gives us a grand selection. He says there were more there than could be found in the deserts of Libya or in Ethiopia, or above the Red Sea.

"Chelidri, iaculi e faree ceneri con amphisbena."

Not unlike Milton's list (Par. Lost, x. 525)—"Asp and amphisbœna dire"—

"Cerastes horned, hydrus and ellops drear."

In other passage, speaking of the Furies (Inf. ix. 41), who

"Con idre verdissime eran cinte,
Serpentelli e ceraste avean per crine."

As a whole they are more interesting as mentioning the snakes known to the ancients than for any other reason, for they come from Lucan's 'Pharsalia,' and are to be found in Pliny's Natural History; but some of them are probably Italian, for Virgil speaks (Geo. xi. 214) of "nigris exesa chelydris creta," which may have been *Tropodonatus tessellatus* and *viperinus*, both Italian snakes, that live almost exclusively in the water, and feed on fish.

The *Jaculus* is found in Greece, and may in old times have been found in Italy, though there is no record of it; it is an unpleasing little reptile that hurls itself at one from a tree. He is speaking more from observation (*Inf.* xxv. 53) when he speaks of

“Serpentello acceso,
Livido e nero come grar di pepe”;

a fiery little serpent (fiery in the Biblical sense, that is to say, venomous), partly dark green, partly black. A very good description of the Adder, by one of which I was nearly bitten in the nose one hot day in June when I stooped to bathe my face in a stream near San Gemignano. The little beast was sitting coiled up in the water, with only its head protruding. Both it and the ordinary Grass-Snake very often take to the water, even in England. In White's ‘*Selborne*,’ he says they will stay under water in search of food. There is no doubt that both species frequent damp places where Frogs and the like abound, and will swim after them, if their quarry take to the water. This brings us back to the *Biscia*, which perhaps should have been included in the generic name for snakes, for the word is onomatopœic to represent the hissing animal, an idea which Milton conveys by the frequent repetition of sibilants when describing snakes. Here it is probably the Common Grass-Snake. Dante had seen such chasing Frogs in the swamps around Ravenna, to which the passage above quoted refers; and he says that Cacus had around his chest more snakes than he would have believed could have been found in the *Maremma* (*Inf.* xxv. 19), that other marshy district on the west coast of Italy, part of which was drained by Napoleon, part planted more recently with eucalyptus. There are several other references to snakes, but they are not worth anything from the naturalist's point of view, except the one that invaded the happy vale in *Purgatory* (*Purg.* viii. 98); for, though he gives a fabulous touch to it by saying, “possibly it was the one that gave the bitter fruit to Eve,” yet it is drawn from life; for he says that it pursued its way through the green grass and bright flowers, turning every now and then its head towards its back, and licking like a beast does when it smooths its coat. A description from which Milton has borrowed (*Par. Lost*, ix. 525).

He mentions other reptiles, but they are fabulous, with the exception of the Lizard—the bright southern creature, not the dull brown reptile of our heath-lands. He speaks of it as darting from hedge to hedge in the blaze of the summer sun like a flash of lightning (Inf. xxv. 79)—

“Come il ramarro sotto la gran ferse,
Ne’ di canicular cangiando sepe,
Folgore par, se la via attraversa.”

And now I come to birds; and it is here that the poet is at his best. One almost hesitates to deal with them, for Dean Church has already touched upon sundry of the poet’s similes with regard to them; but I will venture to go on, for there is still something to be said, even though I must go over part of the ground which he has covered. The words he uses for birds are derived from “avica,” or its diminutive “augello,” “uccello,” and “oca.” The latter is interesting. It properly means a bird, but in modern Italian is only used for goose. I have come across an analogous case in Norway, where in a certain district they employ the word “om”—which merely means fowl—to the Shoveler. “Oca” only occurs once in the poem, and there merely as a crest on the pouch of one of the usurers (Inf. xvii. 63); on a red ground was blazoned “un oca bianca piu che burro,” which would seem to refer to the goose.

As throughout the poem Dante has to allude to masses of souls floating in the air, it is only natural that he should frequently compare them to birds—for instance (Inf. v. 40), the pack of Starlings. The migratory birds that he had watched going south in autumn and north in spring furnished him with many suitable comparisons. Of these he mostly chose the Stork (*Ciconia alba*) and Crane (*Grus communis*), to either which he sometimes alludes distinctly, sometimes leaves the reader to guess to which he is referring. He tells us that of the spirits frozen into the ice (Inf. xxxii. 36), that their teeth chatter, and make a noise like Storks; that quaint incessant noise which is so well represented by Hauff’s “Herr Klapperschnabel.” He sketches for us the Stork standing up in its nest after feeding its young (Par. xix. 92), or draws a picture of the little Stork trying to leave its nest (Purg. xxv. 10). Then we have allusions to

their flight, sometimes in a compact mass, sometimes in a long line (Par. xviii. 73)—

“Come augelli surti di riviera,
Quasi congratulando a lor pastura,
Fanno di sì or tonda or lunga schiera”;

or (Purg. xxiv. 64), like the birds that winter on the Nile, sometimes make of themselves a compact array, sometimes fly in a long line. Milton speaks of both in the same passage.

He says:—

“Part loosely wing the region, part more wise,
In common ranged in figure wedge their way,
Intelligent of seasons; and set forth
Their aery caravan, high over seas
Flying, and over lands, with mutual wing
Easing their flight; so steers the prudent Crane
Her annual voyage.”

So has Dante seen them—seen the great flocks part, and wheel, some north, some south (Purg. xxvi. 43)—seen them, and heard their melancholy note, which is so well adapted to describe the cry of the lost souls (Inf. v. 48)—

“Come i gru van cantando lor lai.”

After the Cranes, Dante has most to say of the Pigeons. He has a wonderfully accurate picture of a flock of them coming down, and setting to work in a business-like way (Purg. ii. 125: “senza mostrar l'usato orgoglio”), pecking at blades of grass, first on one side and then on another, until a sudden scare comes, and they rise *en masse* and fly away. Or, again, what a perfect picture one has of the Rock-Pigeon sweeping down to its nest with firm expanded wings (Inf. v. 82)—

“Quali colombe dal disio chiamate,
Con l'ali aperte e ferme al dolce nido,
Volan per l'aer dal voler portate.”

So, too (Par. xxv. 19), where a Dove settles by its mate, and walks round it cooing; the rhythm of the line helps one to imagine the whole scene—

“L'uno e l'altro pande,
Girando e mormorando l'affezione,”

as “les tourterelles roucoulaient” of La Fontaine's fables lets

one hear the Turtles in the tree. Beyond these he notices the Swan (*Purg.* xix. 46); the Nightingale (*Purg.* xvii. 20), that delights in its own song; the Blackbird, that sings its song of joy for fair weather (*Purg.* xiii. 123) ("come fa il merlo per poca bonaccia"); but, above all the common birds, the Lark (*Purg.* xx. 71)—

"Qual lodoletta, che 'n aere si spazia,
Prima cantando, e poi tace contenta,
Dell' ultimo dolcezza che la sazia."

Of which Landor says: "All the verses that ever were written on the Nightingale are scarcely worth the beautiful triad of this divine poet on the Lark. In the first of them do you not see the twinkling of her wings against the sky? As often as I repeat them my ear is satisfied; my heart, like hers, contented."

In conclusion, I would notice the birds at break of day. As one would imagine, Dante was an early riser, and must have often gone out to wander ere the day had fully dawned. We have already had a picture of early morning with the shepherd. In the "Paradise" (*Par.* xxiii. 1) he describes the bird sitting on its callow young through the night; then, eager to behold its nestlings, and to get them food,

"Previen il tempo in sul aperta frasca,
E con ardente affetto il sole aspetta,
Fiso guardando, pur che l'alba nasca."

So again (*Purg.* xviii.), he speaks of the tuneful quire of little birds, who cease not to employ all their skill—

"Ma con piena letizia l'ore prime,
Cantando, riceveano intra le fogli,
Che tenevan bordon alle sue rime."

And of the Swallow (*Purg.* ix. 14), that near the dawn "comincia i tristi lai." But of all his similes of birds in the early morning, the most perfect is that of the Rooks (*Par.* xxi. 35):—"And, as following their natural custom, the Rooks gather together at the break of day, move to warm their cold feathers; then some go away without return, others return whence they set out, and others, wheeling round, stay where they are." A perfect picture of a rookery waking up, and one which

must have inspired Shelley in his lines on the Euganean Hills:—

“I stood and listened to the Pæan
With which the legioned Rooks did hail
The sun's uprise majestic.
Gathering round with wings all hoar,
Through the dewy mists they soar,
Like grey shades, till the Eastern heaven
Bursts ; and then as clouds of even,
Flecked with fire and azure lie
In the unfathomable sky,
So their plumes of purple grain,
Starred with drops of golden rain,
Gleam above the sunlit woods.”

EARLY ORNITHOLOGISTS.

BY THE REV. H. A. MACPHERSON, M.A.

THE ninth edition of the 'Encyclopædia Britannica,' though now somewhat out of date in scientific matters, contains nevertheless many articles on natural history which can be referred to with advantage. Of the number, Prof. Ray Lankester's article on Zoology is one of the most weighty. But there is a single sentence in this admirable essay to which we have never been able to subscribe, namely, that in which we are informed that "the real dawn of zoology is connected with the name of an Englishman, Wotton" (Encl. Brit. vol. xxiv. p. 803). "The real dawn of zoology" is truly inseparable from the name of an Englishman, but it is the name of William Turner, and not that of honest Wotton which is linked with the foundation of zoological science. Wotton was a book-maker, who made a digest of the zoological knowledge of the classical writers, and published the compendium under the title of *De Differentiis Animalium*. This work was published at Paris, and did not appear until eight years after Turner had published his history of the birds known to Aristotle and Pliny. When it did appear, it failed to add a single new fact to the science which it was supposed to further, for Wotton candidly disclaims any share of original work. He was a compiler, like Goldsmith, and he really deserves no more credit than the author of 'Animated Nature.' The modern science of zoology owes its first conception to the genius of a galaxy of talents, of which Turner, Belon, Gesner, and Aldrovandi were the brightest ornaments, though Rondelet and Salviani accomplished much for ichthyology. If we limit our attention to the science of ornithology, we find that these men knew far more about the anatomy of birds than the majority of twentieth century naturalists. Not only did they observe the habits of wild birds, study their migrations, examine their crops

to ascertain the nature of their food, measure their skins, investigate their changes of plumage, trace their distribution, and describe their eggs, but they paid profound attention to both the muscular system of birds and their osteology. They were nothing if not thorough in their devotion to our beloved science. The attainments of these men were all the more remarkable, because for the most part they enjoyed no advantages of birth. Turner, Belon, and Gesner were all poor men, who fought their way to the front by sheer pluck and indomitable industry. Turner was born beside a Morpeth tannery about 1507; Pierre Belon belonged to some obscure household in the humble hamlet of Soulettière, in Maine, and seems to have been about ten years junior to Turner. Conrad Gesner, a beautiful character, was born and bred in the old town of Zurich. He was born on the 26th of March, 1516. Ursus and Barbara Gesner, his parents, were plain working people. They had a large family to support upon a very meagre pittance. Ulysses Aldrovandi was of noble parentage, but he too had to learn the bitterness of trying to accomplish scientific work with an empty purse. Of dear old Turner we have already spoken at some length, but perhaps the indulgence of the reader will permit a further reference to the father of British zoology. He was a rough, rugged north-countryman—one of those blunt uncompromising men who wish to carry everything their own way, and lack patience for the views of those who differ from them. But if Turner had the misfortune to be a bigoted and determined reformer, he was thoroughly genuine in his professions, and he atoned for all errors of judgment by a life of pain and prolonged exile. His marriage with Mistress Jane Ander increased his difficulties. There is a note of pathos in the reference which is contained in one of his letters to Master Cicell:—"My chylder haue bene fed so long wt hope that they ar very leane, i wold fayne haue the fatter if it were possible."

Pierre Belon's boyhood is a sealed book, but we know that his singular ability and devotion to learning secured for him the notice of kind patrons, who freed him from occasional pecuniary embarrassments, and provided him with a sound education. He was a born traveller, and seems to have been as much at home among the Arabs of the desert as in the society of ambassadors

and courtiers. Wherever he went he made original observations, and his store of information was immense. Conrad Gesner climbed the rungs of the ladder of fame in the teeth of many discouragements. Not only was he one of a large family, but his father fell in the Civil War of 1531; and matters would have fared badly with our hero had it not been that he possessed an excellent relative—John Friccius, his maternal uncle. This benevolent priest was deeply versed in herbal lore, and taught Conrad to study field botany. But the untimely death of his benefactor cast Conrad back upon the mercies of the world, and it was with much difficulty that the stripling became a student at the University of Paris, where he made the acquaintance of John Steiger and other young men, who proved of service to him in later years. It is sometimes taken for granted that Gesner was a mere scribe, who freely utilized the writings of others for his great works, but made few original observations. No less deserved calumny could be heaped upon his memory. Certainly he was a maker of books, but he was not a book-maker in any but the noblest sense. He had as strong a desire to make personal observations as any of us, but it is only the fortunate few who can find leisure and means for research. Gesner visited Italy, and spent a whole month at Venice on purpose to study the fishes of the Venetian lagoons; but, unhappily, war broke out, and compelled him to return home. If he failed to carry out other schemes of travelling, it was not because he lacked enthusiasm, but because his health was poor, and his means were straitened. But though he could not gratify his natural ambition to scour Europe for specimens, he utilized other men to the same end, obtaining both specimens and information from correspondents in many lands. His bright genial nature won for Gesner the loyal support of all who had the privilege of knowing him. Aldrovandi, in his old age, wrote rather slightly of Gesner, because he had arranged his history of birds alphabetically, as Prof. Newton has done in our own day. But we know that Gesner, like the modern naturalist whom he so closely resembled in his great erudition, adopted an alphabetical arrangement solely for the convenience of his readers. He was every bit as anxious to further the interests of taxonomy as his gouty critic, but there is a time and place for everything. Aldrovandi himself was

perhaps the finest zoological genius that Italy has produced. That may seem a strong thing to say, for Italian ornithologists are men of high culture; Aldrovandi was at least the first of the race of ornithologists who have conferred so much honour on Italy. He was nobly born, but was only five years old when a fever carried off his father in his thirty-fourth year. The education of the family thus became the care of the young widow Veronica, who showed a wise discretion in the management of her fatherless children. Ulysses was the flower of her little flock, for he possessed "*un vivacissimo talento, ed un particolare genio agli studi, corrispose mirabilmente alla brama ed attenzione materna.*" He was at first intended to follow mercantile pursuits, but his natural bent asserted itself, and eventually he obtained the professorship of natural history in the University of Bologna.

Having thus referred in brief to the youthful vicissitudes and later triumphs of the four great naturalists of the Renaissance, it is right that we should attempt to supply a slight sketch of what they did for ornithology.

Turner wrote as early as 1544, and he supplied a trustworthy account of the species of birds which he knew to be found in or to be absent from England. He added many details of their habits, and recorded their provincial names. He also aided his zoological brethren on the Continent, especially Gesner, who warmly and impulsively records the great assistance he had received from the most accomplished English naturalist of the day. Pierre Belon was shown a specimen of the Siskin which had been sent to his friend Antoine Martinell by "M. Turnerus medecin Angloys." Turner was a scholar of no mean ability, and his active mind was always pondering over Aristotle. When his boat was becalmed off the Dutch coast, he consoled himself for enforced delay by an endeavour to decide whether the "white semau wuith a black cop" that hovered round the little craft was the "Cepphus" of his favourite author. Turner had a sadly chequered career, and died a disappointed man; but his widow made a good second marriage. If the suffering which lined his brow with furrows and abridged his life was bred of his fiery intolerance of the views of others, at any rate he was a martyr to his convictions, and should be held in the highest

honour and esteem by every successive generation of British naturalists.

A very different man from the Northumbrian controversialist was the father of Gallic zoology. Pierre Belon was the favourite of prelates, welcomed by foreign ambassadors, and flattered by courtly parasites. But he was not spoilt by mature prosperity any more than by his early adversity. A lively, quick-witted Frenchman, with a passionate love of birds, he had obtained a good knowledge of the birds of his beloved France before he commenced those travels which have rendered his name so famous. Aldrovandi says that his French was very bad, but good Ulysses must have his little hit at all possible rivals. Probably he was right in this particular, for the prose of Belon's 'Oyseaux' is difficult reading; but it is one of the few books which we can always take up with fresh pleasure. Belon has the knack of making you feel that he is talking to you about the birds he has just seen; the Vultures that soar around the volcanic hills of Auvergne; the Wall-Creepers that zigzag about the precipices; the Ptarmigan that frequent the high Alps; and many other fowls of divers orders. His prose is full of chit-chat. At one moment he describes the anatomy of some uncommon bird; at the next he is telling you how to cook a Hoopoe, or something equally irrelevant to the theme upon which he was gravely discoursing an instant ago. He was interested by two species of birds which he found in England; for of course he visited England, like Clusius and other contemporary naturalists. The first species, which was new to Belon, was the Norfolk Plover; the other was the Cornish Chough. When he recrossed the Channel he searched for Norfolk Plover, and found that this species was common to France as well as Britain. The migration of birds constantly occupied his thoughts. He was much impressed by the sight of Quail migrating across the Mediterranean. His remarks upon the migratory habits of Pelicans are very interesting; but, indeed, he was a delightful *raconteur*, and could entertain you with some pleasant reminiscence of almost every European bird. His untimely death by the hand of an assassin in the Bois de Boulogne, at Paris, was one of the saddest events of the sixteenth century. Our French *confrères* have reason to be proud of Pierre Belon, of Le Mans.

Conrad Gesner fully shared Belon's love of wild birds. He was a student of the anatomy of birds—as much so as Belon, and more perhaps than Aldrovandi, because Aldrovandi generally persuaded a professional anatomist to act as his prosector. But Conrad was also a good field-observer, with eyes and ears trained to detect the passage of migrating flocks. He took a great interest in the rarer birds of the Swiss cantons. He was cognizant of two or three breeding stations of the Black Stork, one of which was in the neighbourhood of Lucerne.

Gesner was well informed regarding the habits of the Black Stork, which he describes as nesting in trees, usually pine-trees. He dissected one of these birds which had been procured near Zurich. It had been feeding upon beetles and other insects. He remarks that this Stork had a fishy smell; such a bird should first be boiled, and then stuffed with herbs. The flesh was good and sweet, but the skin proved tough. Very pleasant reading is afforded by Gesner's account of the Bustard. The Great Bustard was not a common bird in Switzerland in the sixteenth century. Nevertheless, several of the birds which Gesner examined had been killed near Zurich, or near Coire, in the Tyrol. Conrad had the curiosity to weigh a couple of Bustards. One of these birds scaled nine pounds twelve ounces; the other turned the scales at thirteen pounds and a half. The stomachs of these birds were filled with vetches, but Bustards which had been killed in heavy snow contained pebbles and the bark of trees. Conrad Gesner was told that Bustards were "permultos in Anglia," but whether he owed this piece of information to John Falconer, Thomas Gybson, John Estwyck, to Turner, or Dr. Caius, has not apparently been solved. Gesner corresponded with all five of these British naturalists.

Gesner examined many other birds of local interest—such, for example, as a Spoonbill killed near Zurich in the month of September. The early nesting proclivities of the Crossbill were as well known to this great Swiss as its variations of plumage. He studied the seasonal changes of the Ptarmigan. Friends at a distance often sent birds to be described by Gesner—*e.g.* the Stilt, the Purple Waterhen, the Pin-tailed Sand-Grouse. The most remarkable perhaps of all his discoveries was that the rare Bald-headed Ibis, now lost to Europe, nested on the lofty walls

of ruined castles in Switzerland. He carefully details the breeding stations, including one situated on the promontory of Pola, on the Adriatic, explaining how a man was lowered over the edge of the precipice with a rope, in order to take the young birds, which were esteemed great delicacies by epicures. He supplies precise particulars of the life-history of this little-known Ibis, and furnishes its provincial names. Young Ibises were taken from their nests before they could fly, in order that they might become tame and attractive pets. A dead Ibis, which Gesner had an opportunity of dissecting, proved to have been feeding upon certain insects that affect the roots of standing corn. Notwithstanding the heavy strain of his general literary labours, Gesner sustained his lively interest in ornithology to the close of his life. He tells us that "in the past year we first heard Cranes migrating on the 11th of September, one hour before nightfall; but in the year 1561 we heard Cranes passing through the air at four in the afternoon, and at nine at night, on the 17th of October, the weather being very mild."

It was the introduction of the plague into Europe which brought a great public sorrow to the Zurichers in the year 1565. The fatal carbuncle appeared on the left side of the victim, near the heart. It was in a dangerous position, but was not accompanied by fever. As many of those who were attacked by this terrible malady had already succumbed to its ravages, Gesner took leave of his acquaintances, confided his personal wishes to his most intimate friend, Henry Bullinger, and prepared for the worst. His chief anxiety was to give as little trouble as possible. "*Sic qui in vita multis commodus, molestus fuit nemini.*" About eleven at night, when he felt that the end was near, he summoned his wife, and expressed a wish to be carried into his museum. His desire was gratified, and a little later he gently passed away—"atque paulo post illic in manibus uxoris, inter pias preces, leniter die decima tertia Decembris expiravit."

Aldrovandi was a man of active habits, fond of field-work, and a careful observer. He was also the centre of a large circle of friends, who admired his enormous learning, and delighted to present him with rare or unexpected specimens. It is charming to read of the gifts which poured in on him—now a beautiful Greenland Falcon, which had died at Rome, and was considered

a great rarity; then a nest of young Golden Orioles; now a Bohemian Waxwing; and again a fine male of the Great Bustard. The donation of the latter bird was a great joy to the old naturalist. He induced his friend Auranti to dissect the bird, and figured the gular pouch, "*qua se in vastam capacitatem insinuat*," thus anticipating the labours of John Hunter and other more recent anatomists. The truth is that Aldrovandi often anticipated the so-called discoveries of his successors. Gmelin takes the credit of having discovered the White-collared Flycatcher in 1788, but it was figured and described by Aldrovandi. In the same way the elder Brehm enjoys the honour of having discovered the Firecrest in 1820, though Di Valli figured the species in 1601; while Olina not only figured it again in 1622, but described it—"sopra l'occhio ha una machietta bianca." Aldrovandi figured the black-chinned variety of the Brambling, though it was described as novel by the late Mr. Dawson Rowley. There are many things we might learn from the naturalists of the Renaissance. Read the account which Aldrovandi gives of his visiting a colony of Egrets and other aquatic birds in the Italian marshes, and then compare it with the late Mr. Seebohm's description of the same birds nesting on the Danube. The two accounts are identical in purpose, and not very dissimilar in style. Aldrovandi was the only one of the four great naturalists of his century who lived to a great age. Belon was cut off at forty-five, Gesner died at forty-eight, Turner had apparently reached sixty-one when he ceased from 'The Huntynge of the Romishe Wolfe.' Aldrovandi long survived all his rivals, and finally passed away in his eighty-fifth year, poor in substance, but rich in the esteem of his fellow-countrymen, who gave his mortal remains a magnificent public funeral. He had spent all his money in the preparation of his great works, and had been compelled to accept the favours of opulent patrons; but he had performed a noble service to zoology. His name will never be erased from the list of those who helped to feed the flame of scientific research during the stormy and eventful years which followed the birth of the New Learning in Europe.

BREEDING HABITS OF THE SWIFT.

By THE REV. ALLAN ELLISON.

I HAVE been much interested by the Rev. F. C. R. Jourdain's article on this subject (*ante*, p. 286), and especially by the evidence he brings forward upon the question as to the number of eggs produced at a laying by these birds. How there ever has been a controversy on this point is a puzzle to me, unless it be that comparatively few observers have examined any great number of the nests of the Swift, owing to the difficulty of getting at the places where they build.

In days gone by I had unusual facilities for investigating the breeding habits of the Swift, as a large colony nested in crevices under the eaves of some tall buildings to which I had free access. I examined some dozens of their nests, and found three eggs to be quite a usual number—I should say, more usual than two. The experience of Mr. R. J. Ussher ('Birds of Ireland,' p. 103) agrees with this. The suggestion that when three eggs are found, they are the produce of more than one female, is, I think, untenable. Far more probably, in many cases where but two are found, one of the eggs has been destroyed, or dropped away from home. Mr. Jourdain has mentioned that broken eggs have frequently been found under the nesting-places, showing that eggs sometimes roll out of the nests. This is a thing very likely to occur, as the nest of the Swift is generally a very slight affair—saucer-shaped or almost flat. I have once found the eggs resting on the bare stone, with only a slight ring of nesting materials round them. In the case of almost any bird's nest, it is not unusual for one or more of the eggs belonging to the clutch to be missing. Thus I have found the nest of a Long-eared Owl with but one egg, nearly ready to hatch, though that bird lays five or six eggs. The explanation was soon found, however, for in the same wood there was the nest of a pair of Hooded Crows with the bird hatching.

The well-known fact that Sparrows often quarrel with the

Swifts over the possession of the nesting-holes will account for many an egg being knocked out of the nests. I have also noticed that the Swifts themselves, when disturbed, have a habit of fluttering and scrambling about in their nesting-holes, so that eggs may sometimes be dislodged by the parent birds.

The question also occurs—Are birds which nest in deep holes or crevices known to lay in each other's nests? This takes place most usually in the case of birds which make open nests on the ground, especially those which breed in colonies, as Gulls or Terns; also in the case of Game-Birds, as Partridges or Pheasants; and Water-Birds of various species, as Ducks, Coots, Moor-hens, &c. It certainly occurs less frequently with those which build their nests in trees or bushes, as do most Passerine birds; and, I should say, very rarely, if at all, in the case of birds which nest in holes. This, however, is a subject upon which further investigation is desirable.

The nesting materials which Mr. Jourdain mentions as used by the Swift agree entirely with my own experience. Feathers, small straws, and pieces of rubbish are always found—just such materials as would be blown into the air on windy days; but I have also generally found a quantity of the blossoms, catkins, or bud-scales of various trees, especially those of the oak and beech, which are blossoming just at the time when the Swifts are building, and whose blossoms are frequently blown about by the strong breezes of the end of May. These materials are always cemented together by a glutinous substance secreted by the bird. Indeed, without this curious provision of nature, the scanty materials could hardly be woven together into a nest at all; and it is no doubt intended to keep the substance of the nest from being dispersed, as the Swift generally builds in a large and irregular crevice, and is not able to lay down a large bed of materials filling the entire bottom of the hole, after the manner of the Tits or the Creeper; nor, as in the case of the Sand-Martin, would the loose feathers and straws be held together by being placed in a small and comfortable space.

There is no doubt a good deal yet to be learned about the nesting habits of these interesting birds, for the difficulty of observing them is very great, owing to their breeding in dark holes and crevices out of sight, and often in rather inaccessible situations.

OBITUARY.

WILLIAM DOHERTY.

WILLIAM DOHERTY, the well-known zoological collector and traveller, died at Nairobi, East Africa, on May 25th. He was of Irish descent, born, I believe, at Mount Auburn, Cincinnati, U.S.A., where his parents now reside. He appears to have first gained notoriety as a collector in India about 1886, and made several expeditions on behalf of the authorities of the Calcutta Museum.

In 1888 he travelled through South-east Borneo, and the results of this journey were the first collections he sent to England. The following year he visited the more unexplored parts of South Assam, Manipur, and the Ruby Mines district of Burma, sending to this country extensive collections from these localities; thence he worked down through the Malay Peninsula, and on to Sumatra, returning to Calcutta in 1891.

Early in 1892 he started on a more extended expedition through the Malay Archipelago, visiting Alor, Solor, Sumba, Adonara, Buru, Amboyna, Sumbawa, Timor, Batchian, Sanguir, Talaut (where he discovered a remarkable black species of the genus *Ornithoptera*, named after him), Ternate, Wetter, Gilolo, Tenimber, and other islands, forming most extensive and valuable collections. He finally proceeded to Humboldt Bay, New Guinea; and, although this was a most unhealthy place, and he and his trained collectors were constantly suffering from attacks of fever, the richness of the fauna, and the many new discoveries he was making, induced him to prolong his stay, until they were all attacked with "berri-berri," to which they nearly succumbed. Leaving there towards the end of 1893, he found it necessary to return to his home in Cincinnati, where the state of his health compelled him to remain inactive for nearly two years.

In November, 1895, he was in London, on his way again to the East to explore some of the islands he had not before visited.

On this journey he finally proceeded to Manilla, at the commencement of hostilities between the Governments of the United States and Spain; and afterwards, when in London, related to the writer how, while apparently collecting objects of natural history there, he prepared plans of the harbour and defences, making tracings of them upon articles of clothing, which he succeeded in bringing out with him, and delivering to Admiral Dewey at Hong-Kong, and which he asserted enabled the American fleet to so easily enter and capture the place.

After this he returned to America, but early last year was again in London, arranging an expedition to East Africa and Madagascar; and, although evidently in very bad health, he left in March for Mombasa. From here he worked along the line of the Uganda Railway into the interior, making valuable collections in the neighbourhood of Lake Naivasha and other parts. In the last consignment received from him were a fine series of the remarkable, and hitherto unique, *Papilio rex*, and also the *Danaïd formosa*, of which it is so extraordinary a mimic. Doherty was probably the most successful and extensive collector of birds and insects since the days of Bates and Wallace.

He wrote some papers on the butterflies of some of the localities he visited, which have been published in the 'Journal' of the Asiatic Society of Bengal. He also paid much attention to land-shells, and discovered many new species.

His age is not known to the writer, but was probably about forty-five.

O. E. J.

NOTES AND QUERIES.

MAMMALIA.

Pigmy Shrew in Yorkshire.—Those interested in the distribution of the Pigmy Shrew (*Sorex minutus*) may be glad to learn that I trapped four examples at Kilnsea, near Spurn Point, in Yorkshire, last August. It was apparently quite as abundant there as the "Common Shrew," and, curiously enough, commoner than *Mus sylvaticus*, which, owing perhaps to the prevalence of Stoats and Weasels, was unusually scarce.—R. I. Pocock (Brit. Museum, Nat. Hist.).

Stoat and Weasel Trapping.—It may interest some readers of 'The Zoologist' to know that Stoats and Weasels can be trapped without difficulty with large Schuylers. This, at least, was my experience at Kilnsea, near Spurn Point, in Yorkshire, this August. The first Stoat caught in this way was taken in a trap baited with bread, and set for Water-Rats. It was snapped across the middle of the neck, but was strong enough to pull the trap into the water, where I found it in the morning drowned. I was inclined to suppose at the time that this catch was due to the lucky chance of the Stoat running into the trap, and accidentally setting it off, when hunting along the Water-Rat runs; but the position of his head with regard to the bait suggested an attempt at tasting it. Hence I resolved to try again, and, baiting this time with the skinned carcass of a Bank-Vole, set in a dyke, at the mouth of a hole supposed by a farmer's lad to harbour a Weasel. Two days afterwards I found a fine Stoat lying dead, killed on the spot by the fracture of the parietal bone of the skull, and with the bait, in spite of its unsavoury odour, clenched fast between its teeth. I afterwards caught a Weasel in the same way, the trap being baited with Bank-Vole unskinned. The Weasel was caught well behind the skull, but was apparently killed without a struggle.—R. I. Pocock (Brit. Museum, Nat. Hist.).

AVES.

Chiffchaff Singing in Autumn.—While dressing on the mornings of Sept. 28th and 29th, I distinctly heard a Chiffchaff (*Phylloscopus rufus*) singing, my bedroom window being open at the time. As I was rather

sceptical about it, I went out afterwards into the garden, and saw the bird busily feeding among the leaves of a sycamore. I watched it for about a quarter of an hour, and during that short time it sang thrice—not faint-heartedly, but in good voice. I heard it several times afterwards up till one o'clock, when the song ceased altogether. The weather was remarkably warm, and the sun very bright.—A. H. MEIKLEJOHN (Ashford, Kent).

Breeding of the Blue-headed Wagtail in Sussex.—A nest of the Blue-headed Wagtail, containing four eggs, was found in a turnip-field near Winchelsea on May 31st, 1901, by Mr. George Bristow, Jun. Three of the eggs were accidentally broken, but the remaining egg (unblown), together with the nest and the parents, have been examined by Mr. H. E. Dresser, Mr. Thomas Parkin, and the present writer. Mr. Dresser kindly writes that the birds “come nearest to *Motacilla beema*, Sykes [Proc. Zool. Soc. Lond. 1832, p. 90; cf. Sharpe, Cat. Birds, Brit. Mus. x. p. 521, pl. vi. fig. 6 (head only)], which species, or rather subspecies, differs from *M. flava* in having the cheeks white, with only a broad blue streak through the eye. . . . Sharpe gives the range as Eastern Siberia, India, &c.; but it has been obtained several times in Southern Europe.”—W. RUSKIN BUTTERFIELD (4, Stanhope Place, St. Leonards-on-Sea).

Ægialitis hiaticula nesting in Middlesex (within London Postal District).—Last May (1901) I was surprised to find, on the sewage farm here—which is within the London postal district—Redshanks, Dunlins, and Ringed Plovers, the last named in considerable numbers. From the behaviour of one pair of Ringed Plovers, I was convinced that they had nested, but feared that the eggs had been destroyed by a harrow at work in the field. As I was on the point of starting for Holland, I asked the superintendent, who is a good and observant naturalist, to keep his eye on them while I was away. He now tells me (Aug. 27th) that during my absence he saw three young Ringed Plovers freshly hatched, and actually caught one of them and handled it. This seems to be proof of an extremely interesting event. There is no doubt that Snipe breed in the same place. A Snipe was bleating overhead daily during May, but, though I searched carefully for many hours (wading knee-deep in liquid sewage), the vegetation was so excessively thick and rank, that I was unable to find the nest. I had to-day (Aug. 27th) the pleasure of watching a Snipe on the ground for some minutes through a glass, and in the previous week a brace of Teal were shot (young birds). There are now numbers of Yellow Wagtails about (this Wagtail nests here regularly), and large flocks of

Starlings and Greenfinches, the latter feeding on the pinkish seeds of *persicaria*. A small lot of Ringed Plovers are still about, some of them apparently birds of the year, and a few Green Sandpipers, and Redshanks. I was very close to three of these last birds for some time this afternoon.—R. B. LODGE (Enfield).

Broad-billed Sandpiper in Kent.—An immature female of the Broad-billed Sandpiper (*Limicola platyrhyncha*) was procured on Aug. 31st last near Littlestone-on-Sea, Kent. The specimen has been preserved by Mr. G. Bristow, of St. Leonards. This is the second Kentish example of this species that I have examined in the flesh. The first, also an immature female, was obtained at the same place on Sept. 6th, 1896, and was recorded by Mr. Boyd Alexander (Zool. 1896, p. 411).—L. A. CURTIS EDWARDS (31, Magdalen Road, St. Leonard's-on-Sea).

Occurrence of the Broad-billed Sandpiper in Sussex.—An immature male of *Limicola platyrhyncha* was shot on the shore near Bexhill by my friend Mr. A. C. Wendell Price, on Sept. 14th last. Early in the morning of that day he fired a "right and left" at a party of three birds (the only waders observed during the morning) flying strongly westward, and killed the specimen in question, together with a Dunlin. On viewing these birds the next day, I had the pleasure of identifying the Sandpiper, which is very similar to the recent Kentish specimen recorded by Mr. Edwards, *supra*.—W. RUSKIN BUTTERFIELD (4, Stanhope Place, St. Leonards-on-Sea).

Wood-Sandpiper in Co. Dublin.—On Aug. 19th I flushed and obtained a Wood-Sandpiper (*Totanus glareola*), in immature plumage, near Sutton, Co. Dublin. This, I believe, is the first occurrence of this bird in Co. Dublin, three having been shot at various times in the adjoining county of Wicklow, and one in Co. Waterford, this specimen being the sixth recorded from Ireland.—W. J. WILLIAMS (19, Garville Road, Dublin).

Sandwich Tern on the Norfolk Coast.—An adult male Sandwich Tern (*Sterna cantiaca*) was shot by my son on Sept. 14th from a rowing-boat within half a mile of Hunstanton Pier. Mr. Clarke, of Snettisham, who set it up for us, told me that only one or two others had passed through his hands. I have seen several other Sandwich Terns about, probably passing along the Wash on migration from their breeding-places on the Scotch and Northumbrian coasts. It is quite possible (*vide* Zool. 1894, pp. 88, 89) that this species does occasionally breed on the Norfolk shore.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds, Suffolk).

Ornithological Notes from Shetland. — I have much pleasure in recording the fact that a pair of Chaffinches (*Fringilla cælebs*) nested this summer in the shrubbery adjoining my house, and brought out two young ones, which were able to fly on Aug. 24th. The whole family came daily to be fed along with the fowls, and are very tame. A number of Redstarts (*Ruticilla phænicurus*) made their appearance on Sept. 5th. This is somewhat earlier than usual; they generally arrive here in October. On May 11th, 12th, and 13th a Nightjar (*Caprimulgus europæus*) was seen by me and by others at Baltasound. The Great Skua (*Stercorarius catarrhactes*) has increased in numbers greatly during the past few years, there being at least eighty-four birds on this island. It is a pity that something cannot be done to prevent the wholesale destruction of that magnificent bird, the Great Black-backed Gull (*Larus marinus*), which is becoming rare here. I cannot ascertain that it ever does much harm, yet our County Council has declared it to be "vermin," and has employed men to destroy it.

Since writing the above I have been fortunate enough to have brought to me another rare bird, *viz.* the Great Spotted Woodpecker (*Dendrocopus major*). The bird—a young male—was caught by a native in a stubble-field close to his house, situate in the most northern part of this island. It was in a most dilapidated and starving condition. The weather for many days previous to its capture on Sept. 9th had been very wet and stormy, with heavy gales from the east and south-east. Though instances of the occurrence of the Great Spotted Woodpecker have been recorded from Shetland, I have never been fortunate enough to come across one till now. A female Spotted Crake (*Porzana maruetta*) has been brought to me; it was caught close by Cliff Lock, near here. This is, I think, the fourth time this bird has been recorded from Shetland.—T. EDMONDSTON SAXBY (Halligarth, Baltasound, Unst, Shetland).

REPTILIA.

The Sloughing of Serpents.—In continuation of Dr. Leighton's communication of my notes upon the sloughing of an Indian Python (*ante*, p. 301), it may be of interest to bring them up to date, as follows:—

January 14th, 1901.—Python showed usual signs of sloughing upon this date, and entered his bath upon the following day, remaining there until the 19th, when he left the water. Re-entered again the same day, and remained until the following day, when he shed the slough in the water in many small pieces.

April 1st.—Python entered his bath, and remained until the 12th, when he cast the slough in the water in two pieces.

June 13th.—Python entered bath upon this date, and remained continuously in the water until the 28th, when he shed the slough in the water. It was in two pieces, with many rents in it.

This Python has therefore shed sixteen sloughs in four years.

A small Boa Constrictor, six feet in length, which I obtained on July 3rd, 1901, entered his bath upon the 8th, and remained there continuously, but not always completely submerged, until the 14th, when it left the water, but did not shed the slough until the 16th. The actual operation of shedding occupied only twenty minutes. The slough was in one piece, and almost perfect. This Boa entered its bath again on Aug. 15th, without showing any signs of sloughing, and remained there continuously until Aug. 26th, when it left the water, having exhibited the first signs of sloughing upon Aug. 20th. The slough was cast, quite perfect and all in one piece, upon Sept. 1st.

Upon July 18th I purchased two young Boa Constrictors which had been born in captivity on July 10th, 1901. They were each about fourteen inches long. They both showed signs of sloughing when they arrived, and spent most of their time curled up in the water-tank. One of them left the water on July 27th, and cast its skin immediately after. The slough was in one piece and quite perfect, but the head was torn off. The other young Boa shed its slough on July 31st, also in one piece, but minus the head. It left the water three days previously. The one which cast its slough first constricted and swallowed a young mouse on Aug. 27th—its first meal. The other has not fed up to the time of writing (Sept. 2nd). Both of them are now about eighteen inches long, and much more lively and active than the larger snakes.—W. J. CLARKE (44, Huntriss Row, Scarborough).

The Sand-Lizard in Berkshire.—I notice (*ante*, p. 355) that the Sand-Lizard (*Lacerta agilis*) is spoken of as being restricted in Britain to the southern half of England. Is it known to occur in Berkshire? The country people here have assured me of the occurrence of large Lizards (presumably Sand-Lizards) in the neighbourhood, but I have never met with any individuals myself, though the locality appears to be fairly suitable for them. I fear there is little dependence to be placed on what is said by ordinary country people in natural history matters. Here the great Green Grasshopper and the larva of the Death's-head Hawk-moth are both known as "Locusts," and a Lizard of large size, said to have been captured in a neighbouring parish some ten years ago, was pronounced by a villager to be a Viper. If

any contributor to 'The Zoologist' could inform me of localities in Berkshire in which the Sand-Lizard occurs, I should be obliged.—W. H. WARNER (Fyfield, near Abingdon, Berks).

ARACHNIDA.

The Distribution of the Diadem Spider.—It is generally taken for granted, I believe, that *Aranea diadema*, Linn., the so-called Common Garden Spider, is uniformly distributed throughout this country. A collecting experience of some years' duration in various counties in the South of England had impressed this idea upon my mind, and the material that has passed through Mr. O. P. Cambridge's hands prompted his statement that this Spider "is found in all parts of Great Britain and Ireland." I was therefore surprised to find no trace of it at Kilnsea, a small village near the extremity of the promontory that ends with Spurn Point, in Yorkshire, where I collected in the latter half of August—a time when this Spider is in full force in the localities it frequents. That the physical features of Spurn Point contain no element likely to be inimical to the welfare of a species so adaptive in its habits as *diadema* is attested by the presence of such allied forms as *A. quadrata*, *A. cornuta*, &c., which were met with in some abundance; nor, so far as could be ascertained, had there been any exceptional climatic occurrences during the previous spring and winter to account for its local extermination for the time being. The object of this note is to draw attention to the probability that we have yet something to learn on the negative side respecting the distribution of this well-known species, and to induce those who have the opportunity of investigating the point to ascertain its range in the East Riding of Yorkshire, and other parts of the east of England, especially in places where the soil consists of boulder clay.—R. I. Pocock (Brit. Museum, Nat. Hist.).

NOTICES OF NEW BOOKS.

Bird Watching. By EDMUND SELOUS. J. M. Dent & Co.

READERS of 'The Zoologist' require no introduction to Mr. Selous. He practically inaugurated a new method of field observation by his "Observational Diary of the Habits of Nightjars," &c., in our volume for 1899. This paper is not included in the volume under notice, but it contains a wealth of information relating to other birds which is in the truest sense original. The time is now fast approaching when ornithological field work—in this country—will no longer be conducted only with the gun. We have abundantly seen what the camera will do; Mr. Selous has now told us how to work with the field-glass. We shall give no extracts from this book, which demands the perusal of ornithologists; but we shall consider its main thesis, for, apart from observations, it is a book with a motive. That motive is the sanctity of bird-life—applicable, of course, to other living creatures.

To Mr. Selous our "zoologists" have been "*thanatologists*." "Had we as often stalked animals in order to observe them, as we have in order to kill them, how much richer might be our knowledge!" We believe this to be unanswerable, and the writer of this notice must admit that many of the very happiest days of his life passed in procuring specimens are now regarded with very grave suspicion. But we must not exaggerate this emotion. If it is unnecessary to kill for study—and we do not say that in very many cases it is not—it is equally true that it must be wrong to kill for sport,* and by sport the fish must be equally regarded as the bird. The table, as well as the museum, is the culprit. We really enjoyed that piece of Salmon, though it was not necessary to our existence; the unfortunate Lobster

* The newspapers have recently recorded that the Mackintosh of Mackintosh has broken the record for a day's Grouse-driving in Scotland, he and his friends having killed more than nine hundred brace in Inverness-shire.

created no reminiscence of his awful death when we ate it at a late breakfast; and we are still sufficiently unregenerate to hope that those who have the accident in opportunity to shoot will remember us in the autumn. But this does not invalidate the argument of Mr. Selous, and let us remember that the evolution of ethics has been very slow, and is still going on; while that we have moral obligations to other animals than ourselves is a fact only dawning as a revelation. The prophet and reformer must be always in advance of their times, and possibly this is a mark of their true vocation.

Manual of the Birds of Iceland. By HENRY H. SLATER, M.A., F.Z.S., &c., Rector of Thornhaugh, Northants. David Douglas.

MR. SLATER has made good use of his visits to *Ultima Thule* by collecting the material for this Manual. He prefaces his small volume with some valuable hints as to the pronunciation of Icelandic names, and remarks that "many of us seem to consider ourselves entitled to be a law unto ourselves in the manner of the pronunciation and spelling of foreign names and words." A remonstrance on this point will probably always apply, but even some may ask with reference to English words why Mr. Slater spells the name of the Duck generally known as "Shoveler" with a double l? The "Bibliography" is a specially welcome feature, and some of the books are recommended "as likely to be useful." We are quite sure that Mr. Slater's book now under notice supplies a want, and will be more than useful; but all books must be studied by and for themselves. Many an out-of-the-way record is frequently found, and found only, in a decidedly bad book.

Those who take an interest in the advancing science of folklore will find a subject of much interest in Mr. Slater's account of the Cuckoo, "which has never been known to occur in Iceland; and yet few Icelanders will be ignorant (they almost universally have a literary turn) of the Icelandic name of the Cuckoo—*Gaukr*, which is Eddaic, and yet, though the bird is non-existent in Iceland, well known to-day." One of the most entertaining narratives is that connected with the Northern

Wren (*Troglodytes borealis*) ; but we must here have a parting grumble, for when Mr. Slater remarks of a specimen which slipped down a crevasse, and "appeared to go straight down to New Zealand, or somewhere even warmer," he is infringing on our privileges. These jokes cannot be used by the Rector, but belong undeniably to we of the laity. This is one of those little books that will eventually be found on most shelves, and be frequently consulted.

The Life-History of British Serpents, and their Local Distribution in the British Isles. By GERALD R. LEIGHTON, M.D.
William Blackwood & Sons.

SOME of the contents of this volume have already been published in these pages, and the book is devoted to our three British snakes—*Tropidonotus natrix*, the Ring-Snake ; *Coronella austriaca*, the Smooth Snake ; and *Vipera berus*, the Adder. Dr. Leighton has diligently collected all the available information procurable by him relating to these reptiles, and has thus produced an excellent contribution to a complete knowledge of the subject. A very large part of the book is devoted to the Adder, and much useful information is given as to its variation in colouration, which does not appear to be of a local or environmental character. Then we come to that ever recurrent question—does the female Adder swallow her young? Dr. Leighton has, in stating the case for both sides, evidently incurred misrepresentation as an advocate for the swallowing theory ; but this cannot be maintained. He certainly does not deny it, but holds the agnostic position, which is one that is generally misunderstood on any subject. However, a reward has been offered for any single authenticated record of this much reported occurrence, and that reward has never yet been claimed. The position of "doubting Thomas" is therefore a very wise one on this question.

The section relating to the distribution of these three species in Britain is a piece of good work, well done, and an appendix affords the reader an excellent opportunity to fill in his own observational log-book respecting the three species. The illustrations are ample, and a portrait of that sylvan celebrity who rejoices in the appellation of "Brusher Mills" is also given.

EDITORIAL GLEANINGS.

THE British South Africa Company have issued a volume of Reports on the Administration of Rhodesia, 1898-1900, which contains a wealth of information respecting the development of this large area. We can only refer to 'Notes on the Fauna of North-eastern Rhodesia,' written by Mr. C. P. Chesnaye, Secretary to the Administration of North-eastern Rhodesia, and confine ourselves to the report on the Mammalia.

The district lying to the west of the Loangwa and the swamps of Bangweolo and Mweru form a natural home for the larger Mammalia and Reptilia. The Elephant is still to be found in large herds in these districts, its haunts being protected from the hunter owing to the feeding-grounds for a greater part of the year being in almost inaccessible swamps. The formation of a game-reserve in the country lying east of the Mweru Lake, which has been effected by the Administration, will assist in a great measure to preserve these animals. South of the Tanganyika Plateau there are several Swahili traders who continually hunt the Elephant, and there is no doubt that in a few years the Elephants in that district will gradually retire into the reserve, where they can live and breed without fear of molestation. The Rhinoceros is found in several districts, but more or less localized in bushy country. They have been met with on the Loangwa and Chambezi Rivers, and are numerous in the waterless country between M'kupa's village and Kaulungombie on Lake Mweru. The horns of this animal, as an article of export, are not of much intrinsic value, but the hide is valuable cut into strips. The Hippopotamus inhabits all swamps and rivers, and is also found in the sheltered bays of Lake Tanganyika, where these animals are constantly seen in herds of from twenty to thirty. The export of Hippo hide appears to be increasing, as a good price can now be obtained for it in the South African market. As far as can be ascertained, it appears there is a solitary herd of Giraffe roaming about the Loangwa Valley, consisting of from twenty to thirty head. These interesting animals have been seen by traders, and are stated to resemble the Somaliland species rather than that found south of the Zambesi. Owing to the effects of the "Sokoto,"

more commonly known as the rinderpest, which came down the east side of Tanganyika, and swept over this country in 1893, game, especially the Buffalo, Eland, and Lechwe, is scarce in some districts. To judge from the melancholy sight of bleaching bones still evident in the sandy portions of the Mweru district, where grass grows very sparsely, game must formerly have been both abundant and of great variety. Nevertheless, the country is gradually recovering itself, and most districts are now very rich in game of all kinds. A few small herds of Buffalo are still to be met with in the country near Lake Mweru. Roan Antelope, Eland, Hartbeeste (Lichenstein's), and Zebra are plentiful all over the country, especially about the south of the Tanganyika Plateau. Immense herds of Mpala are met with on the east and west of the Luapula River. Pookoo and Lechwe are numerous in the Mweru district, and a few small herds of Pookoo have been seen in the Loangwa Valley. Sable Antelope are not frequently met with, but have been seen in the Mweru district. Around the north of Mweru Lake, and especially on Kilwa Island, Sititunga are numerous, and some very fine specimens have been obtained by hunters. Sassaby (Tsessebe) have been seen west of Lake Bangweolo, but there is no evidence of their being found in any other district. Many smaller species of Buck are well represented. The Wart-hog and Bush-pig are common in any part of the country. The natives, in their language, compare them to a plague similar to Locusts, owing to the havoc these animals do in their gardens.

Carnivora.—Amongst the Carnivora, Lions are to be found in most districts, but, owing to the vast quantities of game, rarely visit settlements. Leopards are also plentiful, and frequent mostly hilly country, but are rarely seen. The Chita (Cheetah), though rare, is found sometimes; two specimens have been obtained in the Tanganyika Plateau lately. The Hyena, both striped and spotted species, are found here; also Jackals of various kinds. Civet and Serval Cats abound in the thickets, and are often trapped by the natives, who make bags and pouches out of their skins. It is stated that the Serval Cat can be easily tamed, and becomes quite domesticated. On the banks of the rivers and lakes two kinds of Mongoose are found, which render a veritable service to mankind by their active destruction of Crocodile eggs, for which they have the greatest fondness.

Quadrumania.—In bushy country the Quadrumania excel all other animals in number and variety. The Chimpanzee inhabits the virgin forests of the Malungi country, the Black Ape is found west of Chivalis, and Grey Monkeys are common everywhere.

LIEUT. BOYD ALEXANDER has contributed to the 'Daily Chronicle' an article on the Forests and Birds in Ashanti. While at Gambaga, the headquarters of the Northern Territories, "good ornithological work was done, and many important forms, including several rare desert Larks, were obtained not only in the district, but to the northward near the Anglo-French boundary, and also in the little-known country around Salaga, which lies close to Togoland, where the German officers have lately been doing much good scientific work. The Ornis of the Hinterland varies considerably to that of the forest region, but many of the same forms are still to be met with. The birds on the whole are not nearly so bright in plumage; the brilliant Golden Oriole, however, is present, but the effects of its plumage lose in the great expanse; its colours need the subtle light and shade of the forest to enhance their beauty. Many of the species obtained at Gambaga are Senegambian, but, besides these, several forms from Kordofan, Abyssinia, and Eastern Africa are represented. The fact of species in North-eastern Africa being found right away up in the Gold Coast Hinterland is very remarkable, and makes it difficult, till further investigation, to assign any sharply defined area for the distribution of West African birds. The movements of birds depend to a very great extent on the rainfall, which, in its turn, is influenced by geographical features, such as forests, deserts, or mountains. The courses of rivers must influence to a great extent the distribution of species. This is readily noticed by observing the vicinity and banks of African rivers, for there numbers of birds may be seen congregated and continually moving up and down the courses. A glance at the map will show what a network of watercourses there are from Senegambia to the Nile. For instance, the Senegal is practically within touch of the Niger, and the later with Lake Tchad; and so on. Furthermore, it must be remembered that tributaries, waterless in the dry season, become during the rains swollen rivers, and this is the period of the year when birds migrate. We know very little about the avifauna in the great bend of the Niger, Haussaland, and nothing concerning the regions about Lake Tchad and Darfur."

IN the Report of the South African Museum for 1900, just received, we much regret to read of the death of Col. J. H. Bowker, who died, at the age of seventy-three, at his residence near Malvern, in Natal. He was one of the oldest of South African naturalists, and since 1872 had constantly contributed to the Museum Collections; he was

also the first entomological explorer of the Transkei and Basutoland, where he held official appointments. He was specially interested in the Diurnal Lepidoptera, and was a collaborateur with the late Curator, Mr. Roland Trimen, in his well-known work on South African Butterflies.

IN the year 1875, the late Mr. Joseph Wolf painted, in his own inimitable and masterly style, a picture of the Labrador Falcon for his friend Mr. H. E. Dresser. For years past this picture has been a source of delight to the numerous friends of the well-known author of the 'Birds of Europe,' who, after their repeated requests that he would allow it to be reproduced, has consented to a small number of impressions being made by the three-colour process. The size of the reproduction, exclusive of margin, is $7\frac{3}{4}$ in. by $6\frac{1}{2}$ in. Each impression will be numbered and signed by Mr. Dresser, and can be obtained from R. H. Porter.

THE General Committee of the Marine Biological Association of the West of Scotland are in a position to offer the following prizes, to be called the "Fred. P. Pullar Memorial Prizes," offered by Sir John Murray, the Honorary President of the Association, in memory of the late Fred. P. Pullar:—

I.—A prize of £50 for a paper on "The Seasonal Distribution and Development of Pelagic Algæ in the Waters of the Clyde Sea Area."

II.—A prize of £50 for a paper on "The Reproduction, Development, and Distribution in the Clyde Sea Area of the Genera *Nyctiphanes* and *Boreophausia*."

III.—A prize of £50 for a paper on "The Formation and Distribution of Glauconite in the Deposits of the Clyde Sea Area and the Adjacent Seas of Scotland."

These prizes are open to investigators from any part of the world who conduct observations in the several subjects at the Millport Marine Station, and who produce, at any time before Jan. 1st, 1905, papers which, in the opinion of a Committee of three scientific men, to be nominated by the Committee of the Association and by Sir John Murray, shall be deemed of sufficient value to merit publication. Those proposing to work for any one of these prizes should make known their intention to the Secretary of the Association, Mr. John A. Todd, 190, West George Street, Glasgow, in order that the necessary arrangements may be made.

